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WITH A TELEPHONE NURSING SERVICE**

**A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science**

**By**

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B.S.N., DePauw University, 1992**

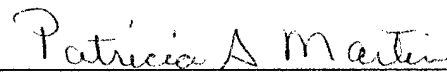
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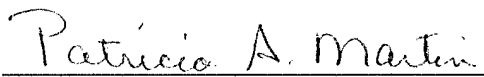
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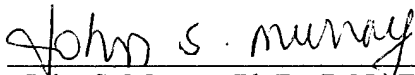
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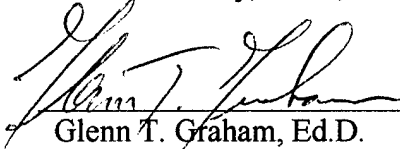
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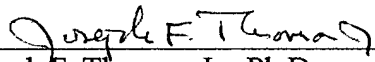
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## ABSTRACT

Eckerman, April L. M.S., Wright State University-Miami Valley College of Nursing and Health, Wright State University, 2003. Military Patient Satisfaction and Self-care Advice Outcomes with a Telephone Nursing Service.

Telephone nursing services facilitate access to appropriate levels of care and provide valuable health care information to callers. Widely viewed as a cost-effective demand management strategy by health maintenance organizations, telephone nursing has seen tremendous growth in recent years. However, little is known about satisfaction with services and influence on self-care activities experienced by patients who use a telephone nursing service. Therefore, further research is needed to explore the usefulness and effectiveness of telephone nursing interventions on patient outcomes.

The literature suggests that telephone nursing services, guided by standardized protocols, may provide safe, cost-effective care for patients while promoting home care, decreasing health care utilization, decreasing workload of primary care physicians, improving health care outcomes, and maintaining high levels of patient satisfaction. Guided by Donabedian's (1988) theoretical framework, the researcher contends that patient satisfaction is a primary indicator for assessing the quality of health care.

The purpose of this descriptive, correlational study was to examine program use, patient satisfaction, and self-care advice outcomes in users of a telephone nursing service offered by a moderate-sized, military treatment facility in the Midwest. A convenience

sample of 100 subjects was obtained from callers to the Health Care Information Line (HCIL) during a 30-day time period. Based on inclusion and exclusion criteria, the sample was obtained through review of computerized documentation resulting from calls to the HCIL. The *Satisfaction Survey* (Greenburg, 1999) was administered by telephone interview to determine study participants' satisfaction level and outcomes of self-care advice provided by the HCIL nurses.

Using results from descriptive statistics, the majority of callers (79%) were female with a mean age of 36.0 ( $SD = 10.2$ ). Nearly half of all participants had called to obtain health care advice for a family member. Based on results of content analysis, the majority of participants called about physiological complaints and was either given home-care advice and/or advised to make an appointment or was advised to make a same-day appointment or go to the emergency department. Participants reported using the telephone nursing service a mean of 2.9 ( $SD = 1.3$ ) times in the preceding six months, while 25% of the callers were first-time users of the service. The level of satisfaction with the telephone nursing service among users was high with a median of 9.0 for all measures on a 1 to 9 Likert-type scale. Similarly, participants reported high levels of agreement with the nurse's suggestions and in following the nurse's suggestions. However, the level of satisfaction in users did not significantly relate to self-care advice outcomes, or if callers followed the suggestions of the nurse, as  $r_b = 0.16$  with a corresponding p-value of 0.10. Discriminant function analysis found that none of four hypothesized predictors of satisfaction actually predicted the likelihood of the users following self-care advice in this sample.

The findings of this study reflect the high level of satisfaction that can be attained by a telephone nursing service. However, negative comments about the service, such as inadequacies of the automated telephone system and a lack of certain resources for the nurses, identify areas of improvement on which nurse administrators may focus their attention.

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## I. INTRODUCTION

Both the American Academy of Ambulatory Care Nursing (AAACN) and the American Nurses' Association (ANA) recognize telehealth nursing practice as a nursing subspecialty. Telephone nursing, which is limited by use of a traditional telephone, is considered a subcategory of telehealth nursing which encompasses the use of other technologies such as e-mail, facsimile, and the Internet. With its own set of assessment, communication, documentation, and evaluation techniques, telephone nursing practice is an extension of the clinical setting (Espensen, 2001). The purpose and benefits of telephone nursing include patient advocacy, provider support, optimization of care delivery by decreasing inappropriate emergency department and provider visits, enhancement of patient satisfaction by allowing alternate avenues for access to care and information, and management of limited health care resources by streamlining patient flow and provider availability. However, concerns about telephone nursing have been identified related to the lack of standardization in practice, liability risks, and overall safety for patients. Additionally, few research studies have examined the effectiveness of telephone nursing or its specific outcomes. More research is needed to explore the use of telephone nursing. Evaluation of patient satisfaction and advice outcomes is one method of evaluating the effectiveness of a telephone nursing service. In this chapter, the research problem is presented along with a discussion of the significance and

justification. The chapter includes the statement of purpose, research questions, definitions, and assumptions.

### **Statement of Research Problem**

Little is known about satisfaction with services and influence on self-care activities experienced by patients who use a telephone nursing service. Specifically, the military population has not been studied. Further research is needed to explore the usefulness and effectiveness of telephone nursing interventions on patient outcomes. Evidence of desirable patient outcomes and optimal patient satisfaction across differing patient populations is necessary to justify telephone nursing practice and ensure its benefits outweigh potential risks.

### **Significance and Justification**

Telephone usage for the delivery of patient counseling is not a new concept. Telephone nursing service was reported in the literature as early as the 1960s and formal telephone triage services emerged in the 1970s (Nauright, Moneyham, & Williamson, 1999). Two important strategies exist in today's managed care environment for health care delivery. First, health promotion education aims to empower individuals to take an active and participatory role in health care, which includes an emphasis on self-care. Second, effective management of chronic disease leads to fewer complications that require costly interventions. Both strategies aim to keep persons at optimal wellness and out of the hospital thereby decreasing overall utilization of health care services and decreasing costs.

Having experienced tremendous growth in recent years, telephone nursing is viewed as a cost-effective care delivery method that facilitates self-care and may improve the management of chronic diseases. Health plans, employer groups, and medical providers offer telephone-based nurse triage services to provide access to medical information and advice that may assist patients in making decisions about their medical needs. Over a 5-year period in the early 1990s, consumer access to telephone nursing services increased from 2 million to approximately 35 million Americans (Larson-Dahn, 2001). According to current health care industry estimates, more than 75 million people in the United States have access to such services (O'Connell, Towles, Yin, & Malakar, 2002). The growth of telephone nursing practice follows significant changes in the delivery of health care over the last two decades and dramatic advances in technology.

Prospective payment systems, increasing health care costs, and capitated budgeting have forced health care organizations to focus on quality care given in the most cost-effective manner (Nauright et al., 1999). Telephone nursing services are believed to facilitate access to appropriate levels of care, enhance continuity of care, and improve quality by providing access to information and services while reducing costs. Consequently, many health maintenance organizations have implemented telephone advice services as a demand management tool. Additionally, telephone triage programs are becoming very common at children's hospitals across the nation in order to facilitate the referral of patients to the appropriate level of health care. Based on findings of one study, referrals to a pediatric emergency department by a nurse-managed telephone triage program had a 33% higher rate of appropriateness versus a control group that included all other sources of referrals (Barber, King, Monroe, & Nichols, 2000).

Research literature supporting the effectiveness of telephone nursing services related to satisfaction, demand management, and cost-effectiveness does exist. In 1993, researchers found that over a 4-year period, just over half of 107,938 callers to a nurse-managed telephone after-hours coverage program were managed with home care advice only, while 28% were given home care advice and seen the next day in the office (Poole, Schmitt, Carruth, Peterson-Smith, & Slusarski, 1993). Another researcher found high satisfaction scores and favorable outcomes for pediatric clients (Greenburg, 2000). Additionally, cost analysis projected more than \$116,000 in annual savings for the health care organization. Of the callers surveyed, more than 80% stated they would have sought medical care elsewhere if they had not spoken to a nurse.

Despite its popularity, various questions have been raised about telephone nursing practice. Safety concerns related to protocol usage, training of telephone nurses, and the lack of standardization in practice are highlighted in the literature (Nauright et al., 1999). In addition, concern that the nurse/client relationship may suffer due to the increasing use of technology has been discussed and questions raised about the appropriateness of telephone nursing in terms of quality care and patient satisfaction (Larson-Dahn, 2001). Hence, with regard to telephone nursing practice, the literature repeatedly calls for research related to quality of care, patient satisfaction, patient outcomes, patient compliance, and access to care (Greenburg, 2000; Larson-Dahn, 2001; Nauright et al., 1999; Poole et al., 1993). Evaluating patient satisfaction and advice outcomes from a telephone nursing service may show the effectiveness of telephone nursing while providing validation for this service's benefits to the health care delivery system as a whole.



### **Statement of Purpose**

The purpose of this descriptive, correlational study was to examine program use, patient satisfaction, and outcomes from self-care advice in users of a telephone nursing service at a moderate-sized, military treatment facility (MTF) located in the mid-west.

### **Assumptions**

1. Study participants were truthful in responding to the survey.
2. Individuals wanted to participate in their own health care.
3. Participants were similar to those not contacted.

### **Research Questions**

1. What were the patient characteristics of the telephone nursing service?
2. What was the frequency of use of the telephone nursing service by the callers?
3. What percentage of callers were first-time users?
4. What was the level of satisfaction with the telephone nursing service reported among users?
5. What were the self-care advice outcomes in users of the telephone nursing service?
6. Did the level of satisfaction in users of the telephone nursing service relate to self-care advice outcomes?
7. To what extent could users be categorized as either “likely” or “unlikely” to follow self-care advice based on predictors of satisfaction to include: perceived helpfulness of the telephone nurse, level of satisfaction with the telephone service,

likelihood of using the telephone service again, and likelihood of recommending the service to friends or family?

### **Definitions**

**Telehealth nursing practice** is “nursing practice using the nursing process to provide care for individual patients or defined patient populations over a telecommunication device” (Espensen, 2001, p. 389). **Telephone nursing** is simply a subcategory of telehealth nursing where practice is limited to the traditional telephone. In this study, registered nurses who are employed by a nurse-managed health care information line provide telephone nursing services 24 hours a day, 7 days a week. The telephone nurses perform assessment, triage using protocols, give self-care advice, and provide health information and education.

**Caller** is defined as an individual who accesses the telephone nursing service. In this study, the caller is defined as either a beneficiary, or a person significantly involved in the care of a beneficiary, of the military health care system who accesses the telephone nursing service and participates in the *Satisfaction Survey*.

**First-time callers** are individuals who are calling the telephone nursing service for the very first time; or in other words, individuals who never used the service prior to the current call. Item 1 of the *Satisfaction Survey* will measure the number of first-time callers (Appendix A).

**Frequency of program use** is a measure of the number of times a caller accessed the telephone nursing service within a specified period of time. In this study, the

specified period of time will be six months previous to calling the telephone nursing service. Item 2 of the *Satisfaction Survey* will measure frequency of program use.

**Self-care** is defined as the personal and medical care performed by the patient, usually in collaboration with and after instruction by a health care professional. **Advice** is defined as counsel about a course of action; guidance. Therefore, **self-care advice** is defined as guidance about personal or health-related care to be performed by the patient based on instruction by a health care professional. In this study, self-care advice is defined as the information or suggestions for personal care given to the caller by the telephone nursing service.

**Outcome** is defined as a consequence. **Self-care advice outcome** is defined as the consequence of either complying or not complying with personal care instructions given by a health care professional. In this study, self-care advice outcome describes the extent to which the caller complied with the self-care advice given by the telephone nursing service. Items 4, 5, 6, 7, and 8 of the *Satisfaction Survey* will measure self-care advice outcomes (Appendix A).

**Satisfaction** is defined as the meeting of expectations or obligations of a need, desire, or want. In terms of nursing care, **patient satisfaction** is defined as the extent or agreement between the patients' expectations and their actual experience in getting a need met by nursing intervention (Eriksen, 1995). In this study, patient satisfaction is defined as the telephone nursing service's degree of success at meeting the callers' expectations and needs. Patient satisfaction will be measured by a survey developed by Greenburg (2000) for a similar telephone nursing service. Items 9, 10, 11, and 12 of the *Satisfaction Survey* will measure patient satisfaction (Appendix A).

## **Summary**

The use of telephone nursing services is increasing in today's health care environment. According to the literature, telephone nursing facilitates access to care, provides appropriate triage and self-care advice, and enhances patient satisfaction while ultimately saving health care dollars. This study evaluated program use, patient satisfaction, and self-care advice outcomes resulting from a telephone nursing service employed by a moderate-sized, mid-western MTF. Chapter II contains the review of relevant literature and the theoretical framework that guided the study. Chapter III details the study methods including: research design, setting, instrument, and procedures; population and sampling plan; data analysis plan; and human subjects consideration. Chapter IV provides an analysis of data including a description of the study sample and results from the research questions. Finally, Chapter V summarizes the study by discussing the findings in terms of conclusions, implications, and recommendations while recognizing limitations of the study.

## II. REVIEW OF LITERATURE

Telephone nursing is defined as a new delivery system that increases the capacity of an organization to assist patients in a cost-effective manner (Nauright et al., 1999). Telephone triage and telephone consultation refer to specific types of telephone nursing. Although few researchers have studied the effects of telephone nursing on outcomes such as patient satisfaction, quality of care, and influence on self-care, the following review examines various characteristics of telephone nursing that have been discussed in the literature. Reviewing from 1991 to 2002, the *Cumulative Index to Nursing and Allied Health Literature* and *Medline* were used as sources for the literature. The first two reviewed articles discussed the emerging practice of telephone nursing from a broad perspective followed by three articles that examined the decision-making process in telephone nursing. The remaining eight articles focused on the evaluation of a specific telephone nursing program related to patient satisfaction, cost-effectiveness, safety, accuracy, and appropriateness of telephone nursing dispositions. Finally, a theoretical framework for assessing patient outcomes of telephone nursing is presented.

### **Research on the Emerging Role of Telephone Nursing**

Telephone triage and consultation have seen tremendous growth in recent years. However, little has been written about this area of nursing practice. In the first of two

articles which explored the emerging role of telephone nursing, the authors provided an extensive review of the literature and discussion related to telephone nursing practice that lends credence for future research opportunities (Nauright et al., 1999). Findings from two focus groups of practicing nurses were compared with findings in the literature to identify issues and implications for nursing practice, education, and research. The first focus group of 10 nurses that regularly staffed call-in advice lines was held in Georgia. The second focus group of seven nurses was held in Texas. Nurses in both groups received advice-seeking calls for a public county hospital. Focus group moderators used an interview guide to direct discussion. The focus groups elicited the following findings: 1) telephone nurses' three major areas of activity were education, advocacy, and client referral to needed resources; 2) protocols were necessary and provided an essential framework for assessment; 3) nurses must be experienced and knowledgeable with a broad range of expertise, effective communication, and listening skills; 4) Benner's novice to expert theoretical framework highlights the importance of experience and a broad knowledge base needed to perform telephone nursing; 5) nursing telephone triage and consultation differ from medical diagnosis and treatment; and 6) thorough documentation was important in terms of quality care and reducing legal liability. The issues reported by practicing nurses were not necessarily those reported in the literature.

The authors discussed additional points that the study participants did not mention such as liability beyond documentation standards, licensure issues and providing telephone nursing services across state lines, lack of practice guidelines for this area of nursing, and the need for educators to incorporate telephone and nursing informatics content into nursing student programs (Nauright et al., 1999). To strengthen telephone

nursing practice, the authors recommended research in the areas of quality of care, outcomes, patient satisfaction, patient compliance, and access to care.

The second article detailed a descriptive, correlational study which explored the relationship between telephone nursing quality indicators and nursing-sensitive patient outcomes in order to assist in the standardization of telephone nursing practice (Larson-Dahn, 2001). The specialty of telephone nursing practice has grown rapidly over the past 10 years. Over a 5-year period in the early 1990s, consumer access to telephone nurse lines increased from 2 million to approximately 35 million Americans, with evidence of continued growth in the future. Research is needed to fully understand the complexity of telephone nursing practice and the impact on patient outcomes. Guided by the Tel-eNurse Practice Model as a theoretical framework, the researcher examined relationships between nursing quality indicators -- assessment, critical thinking, continuum of care -- and patient outcome variables of protocol selection, disposition rating, and documented protocol use. The study occurred in a hospital-based medical call center in the northwest. Telephone triage of 50 cases was selected from free-text electronic records chosen by taking 10 consecutive cases per telephone nurse employed at the call center. The cases were analyzed using the Quality Assurance Checklist developed by the researcher. No validity or reliability measures were reported.

Using data based on 10 cases per telephone nurse, the researcher calculated means, standard deviations, and Pearson product moment correlation to analyze documentation quality indicators in comparison to patient outcomes (Larson-Dahn, 2001). Results were as follows: *assessment* mean was 9.2 ( $SD = 0.29$ ); *critical thinking* mean was 8.9 ( $SD = 0.52$ ); *continuum of care* mean was 8.5 ( $SD = 1.78$ ); *health outcome*

mean was 1.1 ( $SD = 0.15$ ); and *followed advice* mean was 1.2 ( $SD = 0.24$ ).

Relationships were found between *disposition rating* and *critical thinking* ( $r = 0.37$ ;  $p < 0.01$ ), *disposition rating* and *continuity of care* ( $r = 0.30$ ;  $p < 0.05$ ), and *assessment* and *critical thinking* ( $r = 0.48$ ;  $p < 0.01$ ). No statistically significant relationships were found between *documentation quality* indicators and *patient outcomes*. However, a statistically significant correlation occurred between *health outcome* and *following advice* variables ( $r = 0.66$ ;  $p < 0.01$ ). Researchers anticipated a statistically significant relationship between the presence of *documentation quality* indicators and *patient outcomes*. However, the study results did not support this relationship. The statistically significant correlation that was found between *health outcome* and *following advice* variables suggested that the telephone nursing intervention resulted in improved health outcomes for the patient. Of equal importance, the statistically significant relationship found between *assessment* and *critical thinking* lent credence to the idea that documentation may be used to assess competency and provision of safe care.

The review of research literature on the emerging role of telephone nursing provided a broad perspective on issues related to the practice of telephone nursing. Specifically however, three key points were identified as significant to the proposed study. First, further research in the areas of quality of care, patient satisfaction, and patient outcomes was recommended in order to strengthen telephone nursing practice. Second, the research literature described tremendous growth and expanding access to telephone nursing services. Third, the statistically significant correlation found between health outcome and following advice by Larson-Dahn (2001) suggested that telephone



nursing interventions may lead to improved health outcomes if users follow the advice provided to them.

### **Research on Decision-Making in Telephone Nursing Practice**

The next three studies pertained to the decision-making process used by nurses in telephone nursing practice. In the first study, Benner's novice to expert theory of nursing guided research aimed at answering the question of how experienced telephone triage nurses reach decisions (Edwards, 1994). The purpose of the study was to elicit the components of diagnostic reasoning utilized by experienced accident and emergency (A & E) nurses when making triage dispositions via the telephone. Acting as a caller, the researcher presented five experienced A & E nurses (aged 27 to 35 years with 3.5 to 10 years of A & E experience) with two patient scenarios involving an adult with chest pain and a parent reporting the sudden onset of a rash in a child. The resulting interactions were recorded and then replayed to the relevant nurse. The researcher stopped the tape after each question or comment made by the nurse then asked the caller to express personal thoughts at the time. The taped participant responses were analyzed using grounded theory research methods producing five major considerations: most likely cause of the presenting problem, impact of the problem upon the caller, accessibility of alternative sources of health care, ability of the nurse to control the reactions of the caller, and nurses' perception of their own vulnerability. The final triage disposition was made through balancing the most probable outcome against the worst possible outcome. Overall, nurses considered a broad and consistent range of components within a systematic and identifiable framework when making triage dispositions. Several factors

influenced the process of nurse telephone triage beyond the medical aspects. These factors warrant consideration when formulating practice directives such as standardized protocols. Nurses' recognition of ethical, legal, and social responsibilities related to patients, make nursing decisions unique.

Another study pertaining to decision-making in telephone nursing involved the accident and emergency (A & E) department at Manchester Royal Eye Hospital, which operated walk-in and secondary referral services staffed by nurse practitioners that also provided telephone triage (Marsden, 1998). The nurse practitioners held specialized certification in ophthalmology and had extensive experience in A & E. Qualitative research methods were used to investigate strategies used by expert nurses in A & E in telephone triage decision-making. The author did not specify the exact number of study participants, but instead stated that a small number of nurse practitioners were interviewed using a semi-structured style. The interviewer used a number of key words and subject areas. Specifically, participants were asked to explain how they decided to accept or deny access based on a telephone call and what they thought was needed to collect the necessary information on which to base a decision in telephone triage. Based on a review of pertinent literature, the author found that nurses used a broad, consistent range of components when making triage decisions that are within a systematic and identifiable framework. Nurses based hypotheses on the information given and on single symptoms characteristic of a diagnosis. The hypotheses were weighed against personal knowledge and experience. Benner's novice to expert theory suggested that clinical knowledge developed as practical and theoretical knowledge was applied, refined and extended in practice situations. Consistent with the literature, the researcher found that

expert nurses used a process of hypothesis testing and a systematic and complex framework for decision-making. Additionally, intuition, contextual factors, and clinical information were considered when making decisions. The nurses believed questioning skills were critical since direct observation of the client was not possible. Essentially a subconscious process based on experience, the expert nurse's intuitive approach to decision-making was difficult to explain. Yet, upon examination commonalities in the process were identifiable.

The last article pertaining to decision-making in telephone nursing focused on protocol usage (Wachter, Brillman, Lewis, & Sapien, 1999). Protocols were crucial to the safety and standardization of the decision-making process in telephone nursing. To evaluate the effects of standardized pediatric telephone triage protocols on consistency of triage dispositions, researchers developed 15 simulated telephone triage scenarios. Twelve pediatric emergency nurses from a hospital-based pediatric emergency department (ED), participated in this descriptive, comparative study. The mean years of nursing experience was 13.8; 5 years in the ED, 8.4 years in pediatrics, and 1.58 years of telephone triage experience. The female researcher fulfilled the role of a mother with a sick child, called each nurse 15 times, and presented 15 separate scenarios. Triage scenarios involved respiratory-related complaints and the nurses were given only nine protocols to use that addressed respiratory complaints. Each nurse participated in a standardized training plan about these protocols before taking triage calls. Interrater agreement in triage disposition among the nurses was poor with a chance-adjusted measure of agreement of 0.11 (95% confidence interval .02 to .20). The nurses used a mean of three different protocols to reach disposition and arrived at as many as four

different severity endpoints per protocol in a given scenario. Differences between nurses in accuracy of disposition using ANOVA revealed  $p = 0.04$ , which did not reach statistical significance due to the *post hoc* nature of the analysis. The authors concluded that the use of triage protocols did not necessarily result in standardized care. One reason for large variances in disposition was that under certain circumstances, nurses followed their intuition rather than the protocol's recommendation. Although the majority of studies on protocol-based triage have supported the safety of such practice in identifying patients in need of referral to a medical facility, the authors cautioned that difficulties in obtaining follow-up may have led to underestimations of adverse outcomes. Therefore, the use of triage protocols warrants further research before safety can adequately be assessed.

The research literature on decision-making in telephone nursing practice provided additional background information that is important to the proposed study. First, nurses used a complex, yet systematic and identifiable framework for decision-making, which included consideration of variables such as intuition, contextual factors, and clinical information. Second, the use of protocols was critical to the safety and standardization of the decision-making process in telephone nursing and may have significantly decreased ED utilization, thereby lending to decreases in overall health care costs. Although protocol usage was not a variable in this study, staff at the telephone nursing service offered by the study site did use standardized protocols to guide decision-making.

### **Research on Specific Telephone Nursing Programs**

The literature on specific telephone nursing programs consisted of six articles plus two additional, more recent, articles reviewed after data collection and analysis for this study. The research focused on evaluations of specific telephone nursing programs in regards to cost-effectiveness, safety, accuracy, patient satisfaction, and appropriateness of telephone nursing dispositions. The first study stemmed from the need to evaluate a new after-hours coverage system in the Denver area (Poole et al., 1993). To ease the strain and time demands from after-hours telephone calls and patient care, pediatricians requested an area-wide after-hours telephone management system. As the answer to this request, the After-Hours Program (AHP) provided after-hours nurse telephone triage and advice for the patients of 92 Denver pediatricians from 56 different practices.

Researchers described the AHP and presented results of an evaluation that included subscribing physician satisfaction, parent satisfaction, accuracy and appropriateness of telephone triage, and program costs. The AHP received 107,938 calls during the 4-year period under investigation. Using calls where an after-hours visit was advised, a random sample was selected to assess necessity for the visit. Sample sizes used for physician and parent satisfaction variables were specified in terms of percentages rather than exact amounts. In this descriptive study, no information was given related to research instruments. The researchers, using their own specific criteria, performed chart and telephone log reviews. For the 4-year period, no adverse clinical outcomes occurred. Minor errors in protocol usage occurred in 1 out of 1450 calls. After-hours calls necessitated an after-hours patient visit 20% of the time; 78% of these were deemed necessary after-hours visits. Just over half of the patients were managed with home care

advice only, while 28% were given home care advice and seen the next day in the office. Satisfaction among subscribing physicians was 100%, and among parents was 96% to 99%. Total cost to participating physicians ranged from 1% to 12% of their annual net income, depending on a variety of factors. Telephone triage and advice systems may effectively provide after-hours coverage for large patient populations. The AHP provided quality care, eased workload strain for pediatricians, and scored high marks on parent satisfaction. Participating physicians agreed the cost of the program was well worth the benefits.

A second study related to a specific telephone nursing program focused on a pediatric population as well (Kalman, Jugan, Pochron, & Sherman, 2001). The majority of children on Medicaid are inappropriately brought to the ED for routine health care and Medicaid insurance carriers reimburse at a lower rate for ED visits deemed nonurgent versus true emergency visits. In determining the effectiveness of a computerized telephone triage program, the researchers examined its effect on clinical appropriateness of emergency department (ED) visits and rate of insurance reimbursement for such visits in an outpatient health center (KidsCare) of a Pennsylvania hospital as the research setting. A registered nurse (RN) analyzed charts and triage printouts from 58 callers who had gone to the ED as advised to determine correctness of protocol usage and advice given. The RN determined that 67% of the patients had been sent to the ED appropriately. A board certified pediatrician analyzed the charts to determine whether the ED visits were clinically appropriate based on treatment given and found that 89% of the visits were warranted. KidsCare provided care for approximately 3,500 patients from birth to age 18. More than 95% of patients were Medicaid recipients and two-thirds were

enrolled in managed care plans. To analyze Medicaid and insurance reimbursement rates, the total number of ED visits in January 1998 was compared with the number in January 1999 showing a 34% decrease. Additionally, Medicaid reimbursed 92% of KidsCare patient visits at the higher rate, which indicated the visits were clinically appropriate. The implementation of a computerized telephone triage program in this pediatric population resulted in mostly appropriate ED referrals and improved insurance reimbursement rates. However, without baseline data from before program implementation, specific affects of the triage program on the appropriateness of ED referrals was not determined.

Another telephone nursing program did not focus specifically on a pediatric population (Dale, Crouch, & Lloyd, 1998). Researchers in London examined the effectiveness of nurse-led telephone triage and advice by studying a new after-hours coverage system. The researchers evaluated nurses' assessment, triage, and advice given to callers based on differing characteristics of the call such as patient's age, presenting symptoms, and the nurse managing the call. Neither conceptual or theoretical framework nor instrument in the study was reported. Data were downloaded from the Telephone Advice System software used in managing the call system. Using a computerized decision support tool, 25 nurses screened 10,188 calls in a 6-month period or a mean of 407 calls for each nurse. Mean call duration was 6.73 minutes with no significant variation over time, therefore call duration did not vary with nurses' increasing experience with the system,  $t(10,186) = 1.01$ ,  $p = 0.31$  (two-tailed). Of total calls, half were regarding patients less than 15 years old; the remainder was from adult females. A mean of 2.99 assessment pathways for specific symptoms were used per call. Half of the

calls were handled by giving advice alone, whereas the remainder was advised to seek face-to-face medical assessment. Half of the callers up to 60 years of age, received advice alone or were advised to see their general physician routinely as compared to 40.5% of older callers ( $\chi^2 = 68.4, p < 0.0001$ ). The authors of this study provided valuable information about characteristics of calls that telephone triage nurses may encounter and contended that nurses may provide effective after-hours coverage aided by a computerized decision support tool. The fact that just over half of all calls were handled by advice alone seemed impressive. However, follow-up information regarding the appropriateness of advice or the degree to which callers followed the advice was not provided. More research is needed to assess the relationship between nurse telephone advice and patient outcomes.

To support a large, randomized control trial addressing the effectiveness and safety of nurse telephone triage, researchers in the United Kingdom conducted a pilot study to determine the feasibility and acceptability of nurse telephone triage in primary care (South Wiltshire Out of Hours Project [SWOOP] Group, 1997). A conceptual or theoretical framework for the study was not reported. The researchers chose two primary care practices in Salisbury with a combined population of 10,000 as the setting. Overall, 56 calls were received during selected hours of the month-long study and 44 callers were sent a satisfaction questionnaire. The Telephone Advice System, a computer software program, produced printed data summaries, which showed that 30% of calls were handled by nurse advice alone. Subsequent review of records found no patient deaths, hospital admissions, or ambulance calls related to any of the calls. Faxing triage records to a general practitioner for review elicited no disagreement in nurses' triage decisions.



Although no reliability or validity measures were reported for the satisfaction questionnaire, 87% of the 30 responders reported being satisfied or highly satisfied with the advice received from the nurse. Nurse telephone triage was found to be feasible in the setting and well received by the majority of patients in the study.

After establishing the feasibility and acceptability of nurse telephone consultation through a pilot study, the SWOOP group researchers focused on determining the safety and effectiveness of such a practice in primary care (Lattimer et al., 1998). Using an experimental design, the researchers intended to show that nurse-led telephone triage was equally effective to that provided by general practitioners as evidenced by caller outcomes. The yearlong study was conducted in a Wiltshire general practice cooperative with 97,000 registered patients. The target sample consisted of all patient contacts, or 14,492 calls, during the specified hours of the trial. Nurses managed 49.8% of calls during intervention periods without referral to a general practitioner leading to a 69% reduction in telephone advice from general practitioners. The researchers matched 156 pairs of days and weekends in 26 blocks. Each matched pair was randomized to receive the intervention, or the nurse telephone consultation service, during specified hours. Nurses managed the calls with the help of decision support software from which data were downloaded for review after the event. The researchers measured the following outcomes: deaths within seven days of contact with the service; emergency hospital admissions within 24 hours and within three days of contact; visits to A & E within three days of contact; number and management of calls in the control and randomized groups. The results included a 38% reduction in patient attendance at primary care centers and a 23% reduction in home visits as observed during intervention periods. No statistically

significant difference was found in measured outcomes between the control and intervention group. In conclusion, the researchers found that nurse telephone consultation was equally effective to standard management by general practitioners. Additionally, nurse telephone consultation decreased the overall workload of general practitioners by 50% without apparent adverse events or outcomes.

In a more recent study, a researcher examined the quality and effectiveness of telephone nursing (TN), as indicated through patient satisfaction (Greenburg, 2000). Employed by health care organizations to control costs, TN is popular in the current managed care environment as a demand management strategy. To date, only two researchers found in the literature have assessed outcomes of TN services. The researcher used a descriptive, correlational study design to evaluate program use, patient satisfaction, and estimated dollar savings of an established TN program. The TN program was used by a large (approximately 4,000 children) outpatient pediatric clinic in the southwest. Eligible study participants were at least 18 years old and the parent or caregiver of a child enrolled in the clinic. The researcher performed telephone surveys on a random sample of 24% of total callers ( $N=90$ ), or approximately every fourth caller, for a two-month period. To improve accuracy of data, calls were completed within 24 to 72 hours after the TN event. However, the author gave no details about the survey instrument in the article. Results included a first-time user rate of 30% and showed that callers used the TN service an average of three times in a six-month period. Based on Donabedian's model for evaluating care, the researcher measured quality of care in terms of patient satisfaction with technical and interpersonal aspects of care. The mean overall satisfaction response was 8.3 ( $SD = 1.7$ ). A series of calculations based on expected

outcomes if the TN event had not occurred compared to actual outcomes after the TN event yielded an estimated dollar savings of \$2,360 for 1 month or \$116,328 for 1 year. The author of the study provided evidence that a TN program may result in positive outcomes for clients while providing cost-effective, quality care.

The research literature on specific telephone nursing programs provided the most relevant information for the proposed study. Indeed, recent increases in the use of telephone nursing services has in turn generated increasing numbers of research studies related to specific telephone nursing programs. After completion of data collection and analysis, this researcher reviewed two additional studies related to patient satisfaction and outcomes from telephone nursing programs. In the first study, researchers evaluated patient satisfaction and a health plan's return-on-investment for Personal Health Advisor (PHA), a telephone-based nurse triage service implemented by a large health maintenance organization in Kansas City, Missouri (OConnell, Johnson, Stallmeyer, & Cokingtin, 2001). A pre-post study design was used to assess changes in medical service utilization (based on medical claims data) associated with implementation of the triage service. The baseline study period consisted of the 12 months preceding implementation of the triage service while the program period consisted of the 12 months after implementation. Patient satisfaction was assessed by randomly surveying 787 PHA callers via telephone interview; survey response rate was 64%. When asked to rate their satisfaction levels on a scale from 1 to 5, where 1 represented "very dissatisfied" and 5 represented "very satisfied," 93% of callers reported that they were either satisfied or very satisfied with the nurse triage service overall. After implementation of PHA, emergency department utilization rates significantly decreased by 4.3%, from 207 to 198

visits per 1000 plan members ( $p < 0.02$ ), while utilization of outpatient physician services significantly decreased by 5.4%, from 2665 to 2521 visits per 1000 plan members ( $p < 0.01$ ). Decreases in utilization rates resulted in reductions in health plan expenditures that exceeded the plan's costs of providing the service. The plan's estimated return-on-investment was approximately 1.7 dollars for each dollar invested in PHA. The authors concluded that a nurse telephone triage service was a cost-effective program that offered plan members quick access to medical advice while providing high levels of patient satisfaction. However, due to the pre-post study design, other variables during the study period could have caused the decreases in medical utilization rates.

In the second study reviewed after data collection and analysis for this study, callers to an After-Hours Call Center (AHCC) were asked to participate in a prospective, quasi-experimental telephone survey (Moore, Saywell, Thakker, & Jones, 2002). Purposes of the study included: 1) to describe the callers who use an AHCC; 2) to estimate the level of patient satisfaction with the AHCC; 3) to determine the level of patient compliance with the AHCC nurse's recommendations; and 4) to examine the relationship between patient compliance with the nurse's recommendation and selected demographic and clinical characteristics to include level of patient satisfaction. Using a random selection process, researchers called participants ( $N = 427$ ) within 72 hours after accessing the triage service to assess patient satisfaction. The instrument used to conduct the telephone interviews consisted of 8 items on a 5-point Likert scale with 2 yes/no items and 1 item with a choice of "yes, I did it," "yes, I plan to," and "no, I did not" responses. The instrument was tested for readability and understandability prior to use but did not have reliability or validity measures. Results showed that 80% of participants

reported being “very satisfied” or “somewhat satisfied” with the AHCC, while 88.1% of participants were compliant with the nurse’s recommendations. Based on logistic regression analysis, two patient variables had a statistically significant ( $p < 0.05$ ) impact on compliance. Patients, or those calling about them (e.g. parents/guardians, caregivers), who were “very satisfied” were more than 4 times more likely to be compliant. Parents/caregivers calling about patients under the age of 1 year were more than 20 times more likely to be compliant with the nurse’s suggestions. Of callers who were advised to use home care treatments only (no need to see a health care provider), 93.3% either did follow or reported that they intended to follow the advice provided. However, due to the self-reported nature of the data, results may be biased by participants providing desirable rather than completely honest responses to the survey questions.

Overall, telephone nursing services, guided by standardized protocols, may provide safe, cost-effective care for patients while promoting home care, decreasing health care utilization, decreasing workload of primary care physicians, improving health care outcomes, and maintaining high levels of patient satisfaction. However, research evaluating a telephone nursing program in a military population was not available. Therefore, further research is needed to explore the usefulness and effectiveness of telephone nursing interventions on patient outcomes in a military health system.

### **Theoretical Framework**

Donabedian (1988) asserted that patient satisfaction is an indicator for the quality of health care. The model for evaluating quality of care posits that two elements determine the performance of practitioners: technical and interpersonal. Technical

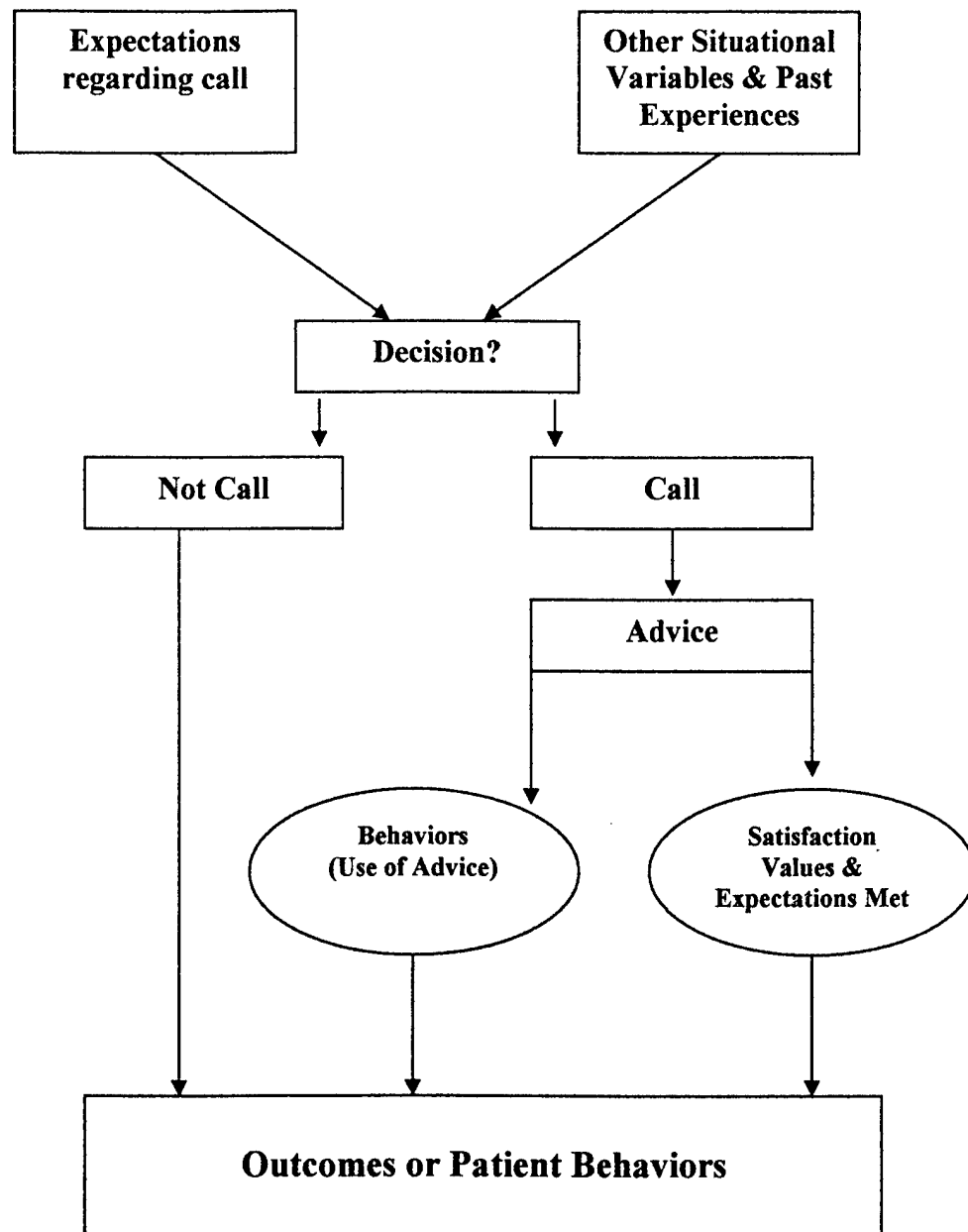
quality may be judged based on the best in current knowledge and technology. The interpersonal relationship that a practitioner establishes with a patient motivates the patient into active collaboration in the care process. Hence, the management of the interpersonal process by the practitioner influences the implementation of care by the patient. Telephone nursing aims to improve access to care for specific patient populations by providing an alternate care delivery system. Patient satisfaction may assess the quality of care delivered by this system. Greenburg (2000) used Donabedian's model in assessing client outcomes by developing survey questions that elicited information related to technical and interpersonal aspects of care. The *Satisfaction Survey* used in the study was adapted from Greenburg's survey in order to appropriately address the target population.

### **Schematic Representation of Telephone Encounter Variables**

As taken from Toth (1998), Figure 1 depicts a schematic representation of the telephone triage event, which accurately reflects the nurse-patient encounter that occurred with the telephone nursing service. Preconceived ideas and expectations about the telephone nursing service had already been formulated by the caller before he/she decided to access the service. Other situational variables and past experiences also influenced the caller's perception or expectations of the telephone nursing service. In other words, the decision to access, or not access, the telephone nursing service was based on the caller's past experiences and expectations. The addition of the decision step in the schematic representation of the telephone triage event was the only variance from Toth's depiction.

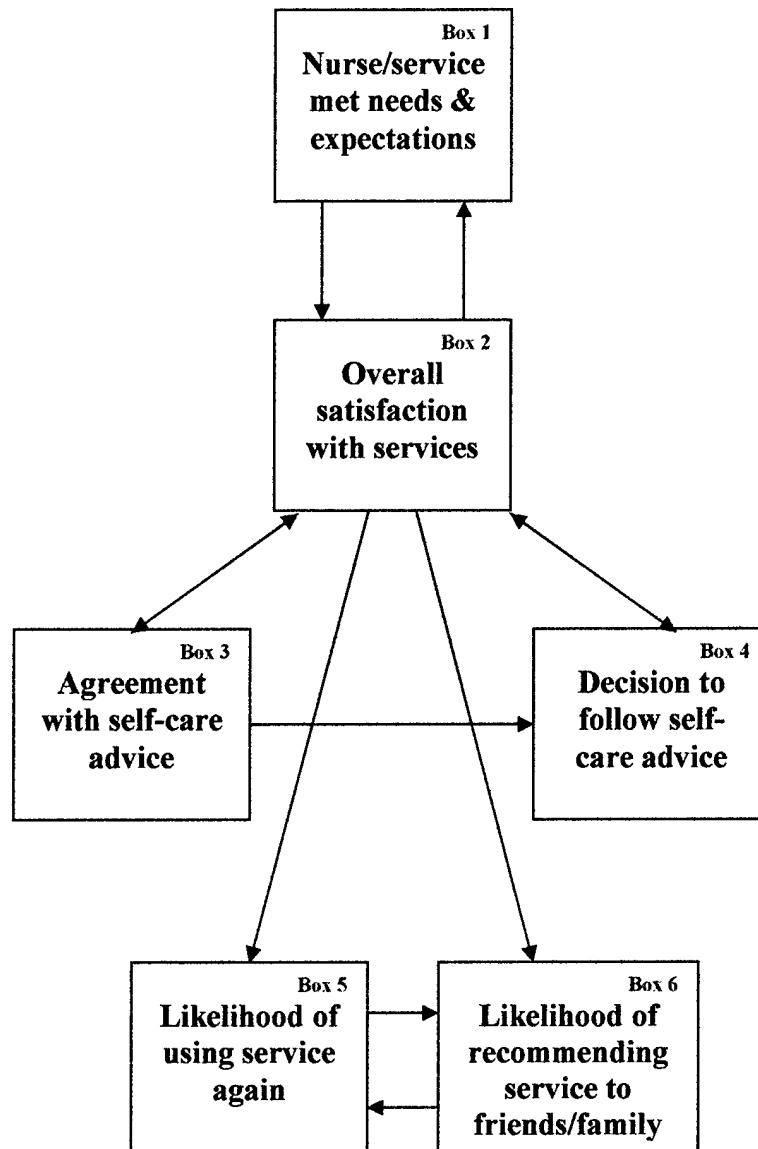
Once the caller accessed the telephone nursing service, the nurse assessed the caller's need or needs. Based on this assessment, protocol directives, and personal judgment and intuition, the nurse made the appropriate health care decision and relayed the information to the caller. The caller was responsible for using, or not using, the nurse's advice, which in turn may have affected the caller's health outcome. Additionally, the caller's perception of the experience played a significant role in determining whether to call the service again in the future.

### Telephone Triage Event



**Figure 1. Schematic Representation: Telephone Triage.** Based on "Patient Satisfaction and Advice Outcomes with a Nurse Managed Telephone Triage Program," by M. H. Toth, 1998, unpublished master's thesis, Wright State University, Dayton, OH, p. 36.





**Figure 2. Patient's Response to Telephone Encounter**

Figure 2 is a schematic representation for the research study. A caller accessed the telephone nursing service with a health care need and specific expectations. The nurse performed an assessment, made the appropriate health care decision, and relayed the information to the caller (Box 1). Box 2 of Figure 2 represents the caller's overall

satisfaction with the telephone nursing service. Box 3 of Figure 2 represents the caller's agreement with the self-care advice given by the nurse. The caller's overall satisfaction and agreement with the nurse's advice both serve as predictors for following the advice (Box 4, Figure 2). Likelihood of using the service again (Box 5, Figure 2) and likelihood of recommending the service to friends or family (Box 6, Figure 2), represent additional indicators of overall satisfaction with the service.

### **Summary**

Telephone nursing practice has shown tremendous growth in recent years. According to current health care industry estimates, more than 75 million people in the United States have access to a telephone nursing service (O'Connell et al., 2002). Researchers have investigated the decision-making process used in telephone nursing and the safety of telephone nursing based on reported adverse events. However, of the small number of research studies related to telephone nursing, few researchers examined actual outcomes and only one researcher followed up with patients within 72 hours of the telephone encounter to discern follow through using the nurse's advice. Chart reviews may not account for all the possible options a patient may take after talking with a nurse. Interestingly, two researchers reported that at least half of the callers required nurse-delivered telephone advice only, but lacked follow up to determine if callers acted upon the advice. Research related to telephone nursing is in its infancy and studies are still needed in the areas of quality of care, outcomes, patient satisfaction, patient compliance, and access to care.

In this study, the researcher expanded the knowledge base about telephone nursing practice by examining the relationship between patient satisfaction and self-care advice outcomes in a military population. Using Donabedian's theoretical premise that patient satisfaction is an indicator for quality of medical care, the researcher examined variables related to a telephone nursing service. Consistent with the ever-increasing number of consumers with access to a telephone nursing service, the study targeted a service that was available to nearly 38,500 military beneficiaries; yet carried little known data about patient satisfaction or outcomes stemming from the service. Finally, the researcher examined the frequency to which callers followed the self-care advice given by the telephone nursing service. Additional information gleaned from the study may serve to clarify or guide telephone nursing practice, improve patient outcomes, and develop theory related to this area of nursing practice.

### III. METHODS

Little is known about the level of satisfaction with services and influence on self-care activities experienced by patients who use a telephone nursing service. More information is needed regarding patient satisfaction and the usage of the advice given. Knowledge of this information is necessary to develop a useful and effective telephone nursing service that positively affects patient outcomes. The study examined program use, patient satisfaction, and outcomes from self-care advice found in users of a telephone nursing service. Specifically, this chapter presents the research design, setting, population, sampling plan, ethical considerations, research instrument, procedures, and a summary.

#### **Research Design**

The research design was descriptive, correlational. Descriptive study designs are used to increase the amount of information known about characteristics within a specific area of study by examining situations as they naturally happen. This gathering of information must occur before causal relationships of a particular phenomenon can be studied. Since little is known about patient outcomes from telephone nursing services, a descriptive, correlational study design was chosen to expand knowledge about this area of nursing practice. The purpose of a descriptive correlational design is to examine

existing relationships in a situation (Burns & Grove, 2001). The study described the relationship between patient satisfaction and outcomes from self-care advice.

However, the limitations of descriptive, correlational design should be noted. Most significantly, no attempt was made to control or manipulate variables of the situation. Therefore, causality of one variable by another variable could not be established using a descriptive, correlational design. Additionally, the researcher must select a representative sample, or a sample that reflects the full range of scores possible on the variables being measured, in order to determine the existence of a relationship (Burns & Grove, 2001). Indeed, if the range of scores is shortened, the obtained correlation will be artificially lowered.

### **Research Setting**

The setting for the study was a mid-western military treatment facility (MTF), which provided a telephone nursing service called the Health Care Information Line (HCIL) (Appendix B). Contracted to and administered by a civilian health maintenance organization, the service was offered by all MTFs in the Midwest region. The service was available to any military beneficiary within the region, including the approximate 38,500 beneficiaries enrolled to the specific MTF targeted in the study (T.R. Best, Chief, Biometrics and Analysis, personal communication, March 28, 2003). The MTF was a 65-bed medical center that employed approximately 2,000 professional, technical, and administrative members supporting operational readiness, community healthcare, tertiary referral, education, and research missions. The facility provided over 475,000 outpatient and dental visits, 3,000 same-day surgeries, and 5,000 admissions annually (Unit Mission

Description, AF Form 709: Promotion Recommendation, 2001). The HCIL was staffed with registered nurses 24 hours a day who utilized a set of standard protocols. All calls were logged into a computer database including demographics of caller, type of call, protocols used, advice given, and the caller's primary care provider.

### **Population**

The target population for the study was callers to the telephone nursing service. The accessible population for the study was callers to the HCIL that were enrolled to the MTF. Callers stemmed from the approximate 38,500 enrolled beneficiaries to the MTF and were active duty personnel, dependents of active duty personnel, retired military members, or dependents of retired military members.

### **Sampling Plan**

Convenience sampling was utilized in the study. Callers to the HCIL during a 30-day time period were screened for participation in the study based on inclusion and exclusion criteria. Convenience sampling can be useful in exploring areas where little is known about a phenomenon (Burns & Grove, 2001). Additionally, convenience samples are inexpensive, accessible, and usually less time consuming. However, lack of control for biases is a significant limitation of convenience sampling and the researcher should consider measures that minimize the presence of biases in a study sample. Using a 30-day time period for data collection eliminated any differences due to a specific day of the week.

Inclusion criteria included: 1) callers identified as enrollees of the previously mentioned MTF; 2) callers who identified themselves as calling with a health care problem; 3) callers had to be able to speak and understand English; and 4) callers identified during the specified 30-day time period. Exclusion criterion included: 1) callers given instruction to be seen immediately at the nearest emergency department, because these callers received advice which did not apply to the definition of self-care; 2) callers that were 17 years of age or younger, who therefore could not independently consent to participate in the study; 3) repeat callers that were already surveyed based on a previous call; 4) callers that could not be contacted within 72 hours from the time the HCIL was accessed in an attempt to reduce recall bias and distortion (Greenburg, 1999). Additionally, this time period allowed the potential study participant to carry out any instructions or advice given by the nurse and determine improvement or deterioration in the patient's condition. The last two exclusion criteria were added after approval of the study proposal.

Determining sample size required consideration of multiple factors. First, since most of the research questions were descriptive, the accuracy of results in describing the population would improve as the sample size got larger. Second, research question #6 involved correlation. Based on power analysis (Power Analysis for the Social Sciences software program), a sample size of 46 subjects was needed in order to detect moderate/weak correlation. Additional factors to consider in determining sample size included 1) the actual volume of calls to the HCIL from enrollees of the MTF; 2) the number of potential study subjects who would not be included in the study due to exclusion criteria or refusal to participate; and 3) realistic time constraints for the

researcher. Allowing consideration for all of these factors, the sample size for the study was 100 subjects.

The sample was obtained through review of computerized documentation resulting from calls to the HCIL. The HCIL contractor, for every patient encounter, sent a hard copy of the computerized documentation to a central location at the MTF where the researcher then received the information.

### **Human Subject Considerations**

In research, protection of the following human rights is required: 1) the right to self-determination; 2) the right to privacy; 3) the right to anonymity and confidentiality; 4) the right to fair treatment; 5) the right to protection from discomfort and harm (Burns & Grove, 2001). The right to self-determination involves the recognition of a person's freedom to make decisions and control his/her own life. Therefore, potential subjects were informed about the study and allowed to voluntarily choose to participate or not through the use of a script for the telephone survey (Appendix C). Additionally, participants were able to withdraw from the study/interview at any time without repercussion. The privacy and confidentiality of study participants was ensured in the following ways: 1) through the use of a coded numerical system to replace the person's name and social security number on the computerized documentation sheet; 2) the same coded numerical system was used to link the computerized documentation sheet to the patient's survey rather than putting a name on the survey; 3) collected data were kept in a locked filing cabinet where the researcher had sole access. The right to fair treatment was protected by the right of voluntarily participation and through strict adherence to a



script for the telephone survey so that every study participant was treated the same. Since the study did not involve actual treatment or manipulation of subjects, minimal risk was expected for study participants regarding protection from discomfort and harm.

### **Instrument**

Developed by a graduate student in 1999 for a thesis project, the *Satisfaction Survey* was adapted for use in measuring the satisfaction level and determining outcomes of self-care advice of callers to the HCIL (Greenburg, 1999). The *Satisfaction Survey* consisted of 15 items related to the research questions (Appendix A). Three items required simple yes/no responses. Four items required responses based on a 1 to 9 point Likert-type scale (1=lowest score and 9=highest score). The balance of the survey items consisted of open-ended items allowing for an open response from the participant. Demographic queries about age, gender, and beneficiary status were not included as survey items since this information was obtained from the computerized printout which documented information from the telephone encounter.

As is typical with surveys that do not result in an overall score, the instrument had no published reliability. Furthermore, in order to avoid undue burden on the callers, test-retest was not performed. However, the instrument did have established content validity. The *Satisfaction Survey* was presented to a group of experts familiar with telephone triage and to a small convenience sample from a pediatric outpatient population to assess applicability and ease of use (Greenburg, 1999). The instrument was used in a pediatric population, where responders were the adult parents, for the author's thesis project. The *Satisfaction Survey* was developed to be administered via telephone interview for several

reasons. First, telephone interviews are less costly in terms of both time and money than face-to-face interviews and self-administered mail-in questionnaires. Second, the telephone interview schedule can be flexible, which benefits both the interviewer and the interviewee. Other advantages of this telephone survey included: 1) low refusal rates, 2) high completion rates, and 3) efficient and timely method of collecting useful information (Greenburg, 1999).

### **Procedures**

After receiving approval from the agency (Appendix B) and the Institutional Review Board (Appendix D) to conduct the study, data collection began and occurred continuously (in consecutive days) until the desired sample ( $N = 100$ ) had been obtained, which required 30 days. The researcher began data collection by first retrieving the computerized documentation printouts of telephone encounters from the MTF. Previously described inclusion and exclusion criteria were used to determine potential study participants. Completing all telephone surveys within 24 to 72 hours after the telephone encounter, the researcher read a scripted introductory statement and disclaimer (Appendix C) prior to beginning each telephone interview. In addition to obtaining verbal consent at this time, respondents were given the approximate length of time needed to complete the interview. For those who wished to participate but the time was not convenient, arrangements were made to call back at an agreed upon time. The telephone interview followed the order of the survey and responses were recorded on a numbered call sheet. To reduce non-response error, a total of five callbacks were attempted before the subject was replaced. No message was left when an answering

machine was contacted. Instead, continued attempts to contact the potential study subject were made up to a maximum of five attempts, at which time the subject was classified as a “non-response”.

Costs related to data collection were minimal and mostly due to long-distance telephone billing. Since study participants were limited to enrolled beneficiaries of the MTF (and therefore located within a 40-mile catchment area), telephone costs were manageable for the researcher. Additionally, approval of government phone use was granted to the researcher as a member of the military.

### **Summary**

The purpose of this descriptive, correlational study was to examine program use, patient satisfaction, and outcomes from self-care advice found in users of a telephone nursing service. The setting for the study was a mid-western MTF that offered a health care information advice line staffed by registered nurses 24 hours a day to approximately 38,500 beneficiaries. Data were derived from the *Satisfaction Survey* via telephone interviews with 100 study participants. Data generated from the *Satisfaction Survey* were analyzed using descriptive statistics, biserial correlation, and discriminant function analysis. The study aimed to identify if callers who utilize a hospital-based telephone nursing service are satisfied with the services and if they follow through with advice received from a nurse.

#### IV. ANALYSIS OF DATA

In this descriptive, correlational study, a telephone survey was utilized to collect data from individuals who had recently called a telephone nursing service requesting health care information. The purpose of the study was to examine program use, patient satisfaction, and outcomes from self-care advice among users of one telephone nursing service. Currently, little is known about satisfaction with these services and their influence on self-care activities experienced by patients who use a telephone nursing service. Specifically, the military population has not been studied. Further research was needed to explore the usefulness and effectiveness of telephone nursing interventions on patient outcomes. The purpose of this chapter is to present the analysis of data as performed in collaboration with Wright State University Statistical Consulting Center and the findings from that analysis. SPSS Version 11.1 was used. Content analysis was used to code responses to four open-ended survey items. Two coders independently classified the responses into categories of content. This chapter includes a description of the sample, a brief overview of the research instrument, analysis of data by research questions, the content analysis, and a summary.

##### **Final Sample**

Data were collected over a 30-day period, November 3, 2002 to December 2, 2002. During this time, the researcher received computerized documentation from a total

of 206 calls placed to the HCIL. Due to the Thanksgiving holiday, 25 calls placed on November 25 – 27, 2002 were omitted from the sample. Based on inclusion and exclusion criteria, 81 of the remaining calls were excluded for the following reasons:

- 48 callers were instructed to be seen immediately at the nearest emergency department or to call 911
- 23 callers could not be contacted within 72 hours of accessing the HCIL
- 5 calls were from repeat users who had already been surveyed
- 5 callers declined to participate in the study

Therefore, the study sample consisted of 100 ( $N=100$ ) participants. From these 100 participants, the researcher was unable to obtain complete demographic data on three female callers who appeared to be ineligible for military health benefits themselves, but were calling the HCIL about a child who was a military beneficiary. Although the researcher can not say for certain, the most likely reason for this situation would be divorce from a military spouse.

### **Instrument**

The *Satisfaction Survey* was adapted for use in measuring satisfaction level and determining outcomes of self-care advice of callers to the HCIL (Greenburg, 1999). The *Satisfaction Survey* consisted of 15 items (Appendix A). Demographic items about age, gender, and beneficiary status were not included as survey items since this information was obtained from the computerized printout which documented information from the telephone encounter. However, the researcher did not anticipate a situation where the caller was not the beneficiary, but instead was calling about a child that was a

beneficiary. Hence, the researcher was unable to retrospectively obtain the age for three female callers. Upon completion of data collection, all data were then transferred, by the researcher, to a spreadsheet using Microsoft Excel 2002.

### **Description of Sample**

The demographic data were interpreted using descriptive statistics. Mean, standard deviation, median, range, and interquartile range were calculated to summarize the continuous variable of age. Frequencies and percentages were calculated to summarize the categorical variable of gender. Age and gender were initially analyzed based solely on demographic information of the callers (Table 1). Analysis showed that 79% of callers were female with a mean age of 36.0 ( $SD = 10.2$ ). The mean age of male callers was 38.1 ( $SD = 14.6$ ). However, 48% of callers were actually calling about a family member. Indeed, 53% of females were calling about a family member compared to 29% of males. Therefore, to further describe the sample, a second analysis was performed to describe age and gender of patients based on three categories (a) patient = caller, (b) patient = family member, (c) all callers (Table 2). Analysis showed that when the patient = family member, the mean age of male and female family members was 14.3 ( $SD = 14.4$ ) and 6.8 ( $SD = 9.2$ ) respectively. The median age of male and female family members was 8 and 3 respectively. Both male and female callers called about children but women more often called about younger children; 50% of the patients that men called about were 8 years old or younger while 75% of the patients women called about were 7 years old or younger.

Table 1.

**Demographics of Sample: Gender and Age**

<b>GENDER</b>	<b>N</b>	<b>%</b>	<b>AGE*</b>				
			<b>M</b>	<b>SD</b>	<b>Mdn</b>	<b>IQR</b>	<b>Range</b>
Male	21	21	38.1	14.6	33	27-50	19-65
Female	79	79	36.0	10.2	35	28-42	19-65
<i>Total</i>	100	100	36.4	11.2	34	28-44	19-65

Note: M=mean, SD=standard deviation, Mdn=median, IQR=interquartile range, R=range

\*Female ages included only 76 women, as ages of three women were not available.

Table 2.

**Demographics of Sample: Gender and Age**

<b>GENDER</b>	<b>N</b>	<b>%</b>	<b>AGE*</b>				
			<b>M</b>	<b>SD</b>	<b>Mdn</b>	<b>IQR</b>	<b>Range</b>
Patient = caller	15	15	41.5	16.1	44	25-53	19-65
Patient = family member	6	6	14.3	14.3	8	3-32	3-33
<i>All male callers</i>	21	21	38.1	14.6	33	27-50	19-65
Patient = caller	37	37	38.5	12.6	38	25-47	19-65
Patient = family member	42	42	6.8	9.2	3	1-7	0-37
<i>All female callers</i>	79	79	36.0	10.2	35	28-42	19-65

Note: M=mean, SD=standard deviation, Mdn=median, IQR=interquartile range, R=range

\*Female ages included only 76 women, as ages of three women were not available.

Frequencies and percentages were calculated to summarize the categorical variables of *beneficiary status* and *rank of active duty callers* or *rank of active duty sponsor* for callers who were not active duty in the military. Analysis showed 54% of all patients were family members of active duty while 16% were active duty (Table 3). Based on the previously presented statistics about age, these findings regarding beneficiary status were not surprising. In terms of rank, the data showed that 38% of all patients were non-commissioned officers (E4 – E6), or family members of non-

commissioned officers, while 28% of all patients were company grade officers or family members of company grade officers (Table 3).

**Table 3.**

**Demographics of Sample: Beneficiary Status and Rank of AD or AD Sponsor**

	<i>f</i>	%
<b>BENEFICIARY STATUS</b>		
AD	16	16
AD Family Member	54	54
Retiree	10	10
Retiree Family Member	17	17
Missing	3	3
<b>RANK</b>		
E1 – E3	6	6
E4 – E6	38	38
E7 & above	12	12
O1 – O3	28	28
O4 – O6	13	13
O7 & above	0	0
Missing	3	3

Note: AD=active duty, E=enlisted, O=officer

**Analysis of Data by Research Questions**

**What was the frequency of use of the telephone nursing service?** Responses to Item #2 of the *Satisfaction Survey* (Appendix A), a continuous variable, were analyzed using descriptive statistics including mean, standard deviation, median, range, and interquartile range (Table 4). The mean number of times that participants had called the HCIL in the last six months was 2.9 ( $SD = 1.3$ ). The IQR shows 75% of participants had called 3 or fewer times in the preceding six-month period.



**Table 4.**

**Frequency of Use of the Telephone Nursing Service in a Six-month Period: Item 2**

<i>M</i>	<i>SD</i>	<i>Mdn</i>	<i>IQR</i>	<i>Range</i>
2.9	1.3	3.0	2 – 3	1 - 6

Note: M=mean, SD=standard deviation, Mdn=Median, IQR=Interquartile range, R=Range

**What percentage of callers were first-time users?** Responses to Item #1 of the *Satisfaction Survey* were analyzed using a percentage to report results related to the use of the HCIL based on the formula: number of first-time callers (25) ÷ total number of participants (100) = **25%**.

**What was the level of satisfaction with the telephone nursing service reported among users?** Results of four Likert-type items (ordinal level variables from Items #9, #10, #11, and #12 of the *Satisfaction Survey*) were summarized using the descriptive statistics of range, interquartile range, and median (Table 5). The Likert-type scale was based on “1” for the most negative response and “9” for the most positive response. The results show little variability in responses and a very high level of satisfaction with the telephone nursing service.

**Table 5.****Level of Satisfaction with the Telephone Nursing Service reported among users**

	<i>f</i>	<i>Mdn</i>	<i>IQR</i>	<i>Range</i>
<b>Item 9</b> – helpfulness of nurse in meeting caller’s needs	100	9.0	8.0–9.0	1-9
<b>Item 10</b> – satisfaction with the overall telephone service	100	9.0	7.3-9.0	2-9
<b>Item 11</b> – likelihood of using service again	100	9.0	9.0-9.0	1-9
<b>Item 12</b> - likelihood of recommending service to friends or family	99	9.0	9.0-9.0	5-9

Note: *f*=frequency, *Mdn*=Median, *IQR*=Interquartile range, *R*=Range

**What were the self-care advice outcomes in users of the telephone nursing service?** Results of two yes/no items (Items #5 and #6 of the *Satisfaction Survey* which were categorical variables) were summarized using frequencies and percentages (Table 6). Overwhelmingly, callers reported agreement with the nurse’s suggestion(s) with 95% answering yes. Likewise, 91% of callers answered yes to following the nurse’s suggestion. Indeed, 88% of callers responded yes to both items.

**Table 6.**

<b>Self-care Advice Outcomes in users of the telephone nursing service</b>			
	<b>Total</b>	<b>YES</b>	<b>NO</b>
	<i>f</i>	<i>f</i> (%)	<i>f</i> (%)
<b>Item 5</b> – did caller agree with the nurse’s suggestion(s)?	98	95(95)	3(3)
<b>Item 6</b> – did caller follow the suggestions?	100	91(91)	9(9)
		<i>f</i> (%)	
<b>AGREEMENT – FOLLOW ADVICE</b>			
No - items 5 & 6		1(1.0)	
Yes – item 5; No – item 6		7(7.1)	
No – item 5; Yes – item 6		2(2.0)	
Yes – items 5 & 6		88(89.8)	

**Did the level of satisfaction in users of the telephone nursing service relate to self-care advice outcomes?** To address this research question, a biserial estimate of  $r$  was computed. Biserial technique can be used when one variable is dichotomized and the other is continuous (Munro, Visintainer, & Page, 1986). Item #6 (advice outcome) of the *Satisfaction Survey* was dichotomized (yes or no) while item #10 (satisfaction) was continuous (Likert-type scale). However, limited variance existed in the responses to item #10 which makes the determination of relationships difficult. The biserial estimate of  $r$  was  $r_b = 0.16$ , with a corresponding p-value of 0.10. With a correlation coefficient of  $r = 0.16$ , the relationship between satisfaction and self-care advice outcomes could be described as having “little, if any” strength (Munro et al.). Statistical significance was set *a priori* at the  $p < .05$  level. A post-hoc power analysis was requested. DeAnne Colvard French, Ph.D., Statistical Consultant from Wright State University Statistical Consulting Center stated:

In order to do a post-hoc power analysis, I ran the same two variables (items #6 and #10) through an ANOVA using the univariate general linear model process in SPSS. The actual power level was 0.38...the cause of the problem is apparently the big disparity in the numbers of people who did not follow the advice vs. those who did. If the numbers in each group had been roughly equal, the  $N$  of 100 would have been adequate.

No estimate of the recommended sample size was provided.

**To what extent could users be categorized as either likely or unlikely to follow self-care advice based on predictors of satisfaction to include: perceived helpfulness of the telephone nurse (item 9), level of satisfaction with the telephone service (item 10), likelihood of using the telephone service again (item 11), and likelihood of recommending the service to friends or family (item 12)?** Inferential statistics were used to address this research question. The relationship between independent variables (responses to items #9, #10, #11, and #12 of the *Satisfaction Survey* which were ordinal level data) and dependent variables (item #6 of the *Satisfaction Survey* which had a dichotomized response or nominal level data) was summarized using discriminant function analysis. The Wilks' Lambda for this model was 0.958,  $p = 0.39$  (not significant). Table 7 shows the rest of the analysis for the individual items. Based on the results, none of the four predictors of satisfaction seemed to find an answer for, or predict, the likelihood of users to follow self-care advice. Although none of the items reached statistical significance, item #9 (How helpful was the nurse) and item #10 (How satisfied were you with the service) warrant further investigation with p-values of 0.11 and 0.10, respectively. Referring back to Table 5,

note the limited variability in responses to the four items. Limited variability makes the determination of relationships difficult (Munro et al., 1986).

**Table 7.**

**Summary of Discriminant Function Analysis**

	<b>Standardized Canonical Discriminant Function Coefficient</b>	<b>F</b>	<b>p</b>
<b>How helpful was the nurse?</b>	0.44	2.55	0.11
<b>How satisfied were you with this service</b>	0.67	2.72	0.10
<b>How likely are you to use the service again?</b>	-0.52	0.20	0.66
<b>Would you recommend the service to others?</b>	0.09	0.09	0.77

**Content Analysis Overview**

Utilizing the *Satisfaction Survey*, content analysis was used to address responses to five survey items (#3, 4, 13, 14, and 15), which were open-ended questions. Content analysis is commonly used to code responses to open-ended items in research studies (Weber, 1988). Two coders independently classified the responses to the open-ended items into categories of content. Themes were used to categorize the content into meaningful groups for the study. Both coders independently searched for common themes in the responses to the open-ended questions. Through this analysis the coders identified emerging themes. Content validity for the classification of responses was

calculated as a proportion of total agreement between the coders. The findings from this analysis were triangulated with the responses to the survey. The subject's responses were used to further explain why callers use the service and to describe reactions to the service.

### **Content Analysis by Survey Item**

**Item #3 - Can you tell me why you called to talk with a nurse?** Participants were calling about a child or spouse 48% of the time. Four major themes emerged from the responses to this item and are listed in order of most to least frequent:

(1) physiological complaints, (2) access-related questions, (3) medication-related questions, and (4) other. Reported physiological complaints ( $N = 73$ ) included: fever and/or upper respiratory symptoms, eye and/or throat infections, skin rashes or infections, gastrointestinal symptoms, urinary symptoms, acute injuries, musculoskeletal pain, headaches and/or visual changes, and post-operative concerns. For access-related questions ( $N = 14$ ), some participants called trying to obtain an appointment, while others specifically sought advice about whether or not to make an appointment or go to the emergency department. One participant stated "I was trying to get an acute appointment and the clinic transferred me to the nurse line." Another participant reported "I called to get their point of view on if the illness I had was a bonafide emergency and if I should go to an E.R." Medication-related questions ( $N = 6$ ) centered on symptoms of possible allergic reactions and correct medication dosing. One participant stated "I'm a breastfeeding mom and had questions about taking Benadryl." Responses placed into the "other" category ( $N = 8$ ) included non-specific complaints such as "I felt terrible," reported symptoms that occurred only once in the data, or unique comments such as "I

don't want to go to the doctor unless someone recommends it and I called for educational purposes," or "I mostly needed reassurance about my daughter."

**Item #4 – What was the result of the phone call?** Five themes emerged from the responses to this item and are listed in order of most to least frequent: (1) given home-care advice and/or advised to make an appointment, (2) advised to make a same-day appointment or go to the emergency department, (3) advised to call someone/somewhere else, (4) assisted in making an appointment, and (5) other. Many of the participants ( $N = 56$ ) were given some combination of home-care advice and/or were advised to make an appointment within a specified period of time within 24 to 72 hours. Responses included: "I was given home care advice related to dehydration and advised to make an appointment within 24 hours"; "I was advised to give my daughter Tylenol, remove extra clothing from her, and give her plenty of cold liquids to drink"; and "I was told to be seen within 72 hours." Several participants ( $N = 27$ ) were advised to make a same-day appointment or go to the emergency department with responses such as "the nurse classified it as an urgent event and said to go to E.R. and gave some general advice," or "She said it was probably mastitis and I was advised to be seen within 4 hours or go to the E.R.; she also advised warm compresses, a warm shower, and to drink plenty of fluids." Some of the participants ( $N = 9$ ) were advised to call someone or somewhere else such as the clinic, the primary care manager on-call, or the Poison Control Center. Only two participants were assisted in making an appointment to be evaluated. The "other" category ( $N = 6$ ) was reserved for responses that occurred only once, were non-specific, or were some combination of the first two themed categories such as "The nurse gave me good advice about what to do," or "I was advised that my daughter not go to

school, some home care advice was given, and then told to take her to E.R. if temperature did not return to normal.”

**Item #13 – What was it about this service that you particularly liked and/or disliked?** Responses to this item first had to be divided into categories of “liked” and “disliked”. Next, four emerging themes were identified in the “liked” category:

(1) nurses’ abilities and attributes, (2) availability of medical advice, (3) accessibility of the service, and (4) other. Many participants ( $N = 44$ ) cited specific abilities and attitudes of the nurses in the “liked” category including their thoroughness, patience, helpfulness, understanding, knowledge, calm demeanor, and caring attitude. Positive responses regarding the accessibility of the service ( $N = 40$ ) stemmed from its free, 24-hour, 7 days per week coverage, prompt service, convenience, and cost-lowering potential. Responses included: “I liked having access to someone 24 hours a day when trying to make a decision to come in or not”; “I like that I can call them anytime and I think it would save everyone money”; and “I liked being able to get an opinion without going anywhere.” Positive responses regarding the availability of medical advice ( $N = 36$ ) related to the availability of medical advice from a nurse, assistance in determining if medical attention is necessary, and validation for seeking medical attention either via a clinic appointment or the emergency department. One participant commented “I like the 24/7 availability and that I was able to talk to an R.N.; I also like the immediate medical advice.” Only two responses were placed in the “other” category: “I basically like it all” and “it’s like having your mom to go to.”

Two primary themes were identified from the responses in the “disliked” category. First, a few participants ( $N = 8$ ) were not satisfied with the nurse’s response,



either the content of the response or how it was delivered. One participant stated “I wish more could be done or said; sometimes the nurses don’t really have much information to offer.” Another participant, who shared with the researcher that she was a nurse, stated “I felt like she (the nurse) belittled me and gave bogus information about the axillary temperature reading.” Second, a few participants ( $N = 8$ ) disliked the telephone system. Comments included: “I had a difficult time getting through all the prompts and buttons to get to the nurse and I wasn’t feeling good at the time either”; “I’m not real happy with the voice activated system; its too easy to mess up the system with sounds or talking with your kids”; and “I disliked that the wait time was too long.” Finally, one outlier response was “I disliked that they could not make an appointment.”

**Item #14 – How do you think this service can be improved?** Many ( $N = 51$ ) of the participants offered no suggestions for improvement of the telephone service because they expressed relatively high satisfaction with the service overall. However, of the responses offering suggestions, three themes emerged: (1) improve the nurses’ access to information, (2) improvements and/or changes to the automated telephone system, and (3) other. Suggestions for improve the nurses’ access to information ( $N = 20$ ) included having access to the patient’s medical record and having more information about the local facility’s procedures. Specific comments included: “The nurse should make sure that when they answer that they know about the weekend extension clinic”; “It would be nice if the nurses could be a little more proactive in their recommendations, since it was a weekend and I could not easily contact the physician”; and “The line is not tied into a specific MTF and the nurses are not able to help with specific instructions or follow-up care.” Suggestions for improvements and/or changes ( $N = 19$ ) to the automated

telephone system included the ability to dial the nurse line directly, clarifying the options on the automated line, eliminating the voice automation system, and decreasing wait time. Specific comments included: "The telephone communication service is too lengthy and confusing"; "The voice automated menu is not good, especially for my wife who is foreign-speaking"; and "The voice activated line is a real pain because if my baby is crying in the background, you can't get through." Finally, from the "other" category ( $N = 9$ ), two participants made comments about advertising the telephone nursing service better while another participant commented "It would be nice to have some ability to have an extension to each phone so that if you call back in the same night, you can talk to the same nurse."

After initial review, responses to item #15 (Are there any comments you would like to add?) were not categorized into emerging themes due to the large amount of redundant information that had already been identified in responses from items #3, #4, #13 and #14. Many of the participants ( $N = 39$ ) did not offer responses for item #15 at all, however all remaining responses ( $N = 61$ ) that were given could be categorized into previously identified themes.

### **Summary**

Chapter IV presented the results of the *Satisfaction Survey*. Descriptive statistics (mean, median, standard deviation, interquartile range, range, frequencies, and percentages), biserial correlation, and discriminant function analysis were performed to determine the level of satisfaction and self-care advice outcomes of callers to a telephone nursing service in a military population. In a sample of 100 participants, the majority of

callers (79%) were female with a mean age of 36.0 ( $SD = 10.2$ ). Notably, 48% of participants had called to obtain health care advice for a family member. Participants reported using the telephone nursing service a mean of 2.9 ( $SD = 1.3$ ) times in the preceding six months while 25% of the callers were first-time users of the service.

Based on results of four Likert-type items from the *Satisfaction Survey*, the level of satisfaction with the telephone nursing service among users was high with a median of 9.0 for all measures on a 1 to 9 Likert-type scale. Similarly, participants reported high levels of agreement with the nurse's suggestions and in following the nurse's suggestions. Indeed, 88% of callers responded yes to survey items #5 and #6: did caller agree with the nurse's suggestion(s)?; and did caller follow the suggestion(s)? However, the level of satisfaction in users did not significantly relate to self-care advice outcomes, or if callers followed the suggestions of the nurse, as  $r_b = 0.16$  with a corresponding p-value of 0.10. Finally, discriminant function analysis found that none of the four predictors of satisfaction could predict the likelihood of users to follow self-care advice. However, item #9 (How helpful was the nurse) and item #10 (How satisfied were you with the service) warrant further investigation with p-values of 0.11 and 0.10, respectively. Limited variability makes the determination of relationships difficult.

Content analysis of four open-ended survey items revealed that study participants most frequently called the HCIL with physiological complaints and were either given home-care advice and/or advised to make an appointment or were advised to make a same-day appointment or go to the emergency department. Callers liked the accessibility of the service, the availability of medical advice, and the nurses' abilities and attributes. However, a few callers disliked the nurse's response and/or characteristics of the

automated telephone system. Finally, callers primarily suggested improvements and/or changes to the automated telephone system and improvements in the nurses' access to information as ways to improve the service overall.

## V. DISCUSSION

Chapter V begins with a summary of this descriptive, correlational study which examined program use, patient satisfaction, and outcomes from self-care advice among users of a telephone nursing service. Following the summary is a presentation of limitations and conclusions drawn from the study, a discussion of the study's findings, and implications for clinical practice and nursing administration. The chapter concludes with recommendations for future research and a final note.

### **Summary**

Telephone nursing services facilitate access to appropriate levels of care and provide valuable health care information to callers. Widely viewed as a cost-effective demand management strategy by health maintenance organizations, telephone nursing has seen tremendous growth in recent years. However, little is known about satisfaction with services and influence on self-care activities experienced by patients who use a telephone nursing service. In addition, no research literature was found that examined these variables in a military population. Therefore, further research was needed to explore the usefulness and effectiveness of telephone nursing interventions on patient outcomes.

The purpose of the study was to examine program use, patient satisfaction, and self-care advice outcomes in users of a telephone nursing service offered by a moderate-

sized MTF in the Midwest. The service, called the HCIL, was available to any military beneficiary within the Midwest region, including the approximate 38,500 beneficiaries enrolled to the specific MTF targeted in the study. The HCIL was staffed with registered nurses 24 hours a day who utilized a set of standard protocols.

The target population for the study was callers to the HCIL. The accessible population for the study was callers to the HCIL that were enrolled to the MTF. Using a convenience sample ( $N = 100$ ), data were obtained using the *Satisfaction Survey* via telephone interviews conducted by the researcher.

The study found that the majority of callers (79%) were female with a mean age of 36.0 ( $SD = 10.2$ ), while 48% of participants had called to obtain health care advice for a family member. Participants reported using the telephone nursing service a mean of 2.9 ( $SD = 1.3$ ) times in the preceding six months while 25% of the callers were first-time users of the service. Based on results of four Likert-type items from the *Satisfaction Survey*, the level of satisfaction with the telephone nursing service among users was high with a median of 9.0 (on a 1 to 9 scale) for all measures. Similarly, participants reported high levels of agreement with the nurse's suggestions and in following the nurse's suggestions. In fact, 88% of callers responded yes to survey items #5 and #6: did caller agree with the nurse's suggestion(s)?; and did caller follow the suggestion(s)? However, the level of satisfaction in users did not significantly relate to self-care advice outcomes, or if callers followed the suggestions of the nurse, as  $r_b = 0.16$  with a corresponding p-value of 0.10. Discriminant function analysis found that none of the four predictors of satisfaction could predict the likelihood of users following self-care advice. However, item #9 (How helpful was the nurse) and item #10 (How satisfied were you with the

service) warrant further investigation with p-values of 0.11 and 0.10, respectively.

Limited variability makes the determination of relationships difficult.

Content analysis revealed that study participants most frequently called the HCIL with physiological complaints and were either given home-care advice and/or advised to make an appointment or were advised to make a same-day appointment or go to the emergency department. Furthermore, callers liked the accessibility of the service, the availability of medical advice, and the nurses' abilities and attributes. However, a few callers disliked nurses' responses and/or characteristics of the automated telephone system. Finally, callers primarily suggested improvements and/or changes to the automated telephone system and improvements in the nurses' access to information as ways to improve the service overall.

### **Limitations**

1. The *Satisfaction Survey* had no established reliability.
2. Due to potential fear about elimination of the telephone nursing service if negative responses were given, respondents to the *Satisfaction Survey* may have provided socially desirable answers rather than being completely truthful.
3. The researcher may have had an inherent bias in interpreting findings as a former employee at the study site.
4. The study sample was selected from a specific MTF and could not be generalized to the entire population.

5. Because the study sample was a convenience sample selected from callers to the telephone nursing service, participants may have had a favorable bias towards the service compared to non-callers.
6. Data collected for the study were self-reported and therefore could be inaccurate depending upon recall accuracy of the participants.

### **Conclusions**

1. Most callers to the HCIL are females in their mid-twenties to mid-forties.
2. Nearly half of all callers are asking health care questions about a family member; the family members most frequently called about are young children.
3. Company grade and non-commissioned officers and their family members use the service more frequently than retirees and their family members.
4. Most users of the HCIL are repeat callers who access the service when needed to ask questions related to physiological symptoms for themselves or other family members.
5. Nearly all callers are satisfied with the telephone nursing services provided by the HCIL.
6. Nearly all callers agree with and follow at least some of the nurses' suggestion(s).
7. The actual level of agreement and degree of compliance with the nurses' suggestion(s) can not be determined with the *Satisfaction Survey*.
8. Due to the overwhelming satisfaction reported among users of the HCIL, a much larger sample size is needed in order to detect any significant relationship between level of satisfaction and self-care advice outcomes.



9. The four predictors of satisfaction measured by the *Satisfaction Survey* do not explain the likelihood of a caller following the self-care advice given to them by the nurse. Variables, other than satisfaction, may influence a person's decision to follow, or not follow, self-care advice.

## **Discussion**

In reviewing the methods used in this study, a few areas warrant discussion. First, a representative sample reflecting a wide range of scores on the variable of patient satisfaction is necessary in order to determine the existence of a relationship between patient satisfaction and self-care advice outcomes. The convenience sampling method used in this study diminished the likelihood of finding a significant relationship, because the sample did not adequately capture callers that utilize the service one time and do not call back again. Indeed, most of the study participants were repeat callers and even though 25% of participants were first-time users, the researcher does not know if these callers would have utilized the service again. Due to the limited variability found in the patient satisfaction scores, this researcher could not establish a significant relationship between patient satisfaction and self-care advice outcomes.

Second, a larger sample size could have diminished the effects of limited variability on determining a significant relationship between patient satisfaction and self-care advice outcomes. As noted in Chapter IV, the large disparity in the numbers of people who did not follow the advice ( $n = 9$ ) versus those who did follow the advice ( $n = 91$ ) significantly decreased the statistical power level. To address the issue in a replication study, this researcher suggests *a priori* power analysis to determine sample

size that takes into consideration the proportional difference in the population *or* use of a sampling plan that includes more equitable proportions.

Third, if the same procedures are used in the future, this researcher recommends that data collection occurs during a time period that does not contain a major holiday. The 30-day period for data collection in this study included Thanksgiving. During this time, the researcher was out-of-town and excluded callers for three days since the 72 hour time limitation would expire before calls could be made.

Finally, as a research instrument, the *Satisfaction Survey* warrants further discussion. For measuring patient satisfaction with a telephone nursing service, items on the *Satisfaction Survey* are consistent with items on similar research instruments presented in the literature (Moore et al., 2002; O'Connell et al., 2001; Poole et al., 1993). However, Likert-type items on similar surveys typically use a 5-point scale rather than the 9-point scale used on the *Satisfaction Survey*. In addition, the *Satisfaction Survey* does not provide a very sophisticated measurement of self-care advice outcomes. Specifically, item #4 on the *Satisfaction Survey* asks "what was the result of the phone call?" rather than directly asking for instructions received from the telephone nurse. Item #6 asks "did you follow the suggestion(s)?" which does not adequately determine if the caller followed only some, or all, of the suggestions received from the telephone nurse. Furthermore, an important aspect in determining self-care advice outcomes is knowing the end result from the given advice. For example, was an appointment or visit to the emergency room avoided because of adherence to the nurses' advice? Again, the *Satisfaction Survey* does not accurately measure this aspect of self-care advice outcomes.

Perhaps a better way to view the concept of self-care advice outcomes is in relation to patient compliance. For example, in a study conducted recently, researchers considered no use of medical services (following a triage call when the client was advised to use self-care at home) an indicator of adherence to recommendations (O'Connell et al., 2002). These researchers linked nurse triage call data to medical claims and encounter data to assess patient medical service utilization following a call to the triage service to assess triage adherence. According to study results, the percentage of callers who adhered to triage recommendations to use hospital emergency services, physician office services, or self-care advice was 79.2%, 57.4% and 65.8%, respectively. These findings are significantly lower than the 91% of callers who reported following the nurses' advice in this study, which leads this researcher to question the accuracy of self-reported data.

Before making comparisons between the findings of this study and findings in the literature, demographic similarities and differences of the study samples warrant discussion. Based on the literature, as well as this study, use of a telephone nursing service is especially prevalent in the pediatric population; callers to such a service are consistently parents or caregivers of young children (Dale et al., 1998; Greenburg, 2000; Kalman et al., 2001; Lattimer et al., 1998; Poole et al., 1993). In another similarity to this study, Greenburg (2000) found that the average caller to the telephone nursing service was a 30 year old female. However, a major difference in the sample for this study as compared to samples in the literature is the callers' status as military beneficiaries; none of the studies in the literature review were conducted in a military population.

Findings from this study need to be compared to findings in the research literature in order to further evaluate their importance. First, findings from this study regarding

patient satisfaction with the telephone nursing service are consistent with the research literature in that most users of such a service reported high levels of satisfaction (Greenburg 2000; Moore et al., 2002; O'Connell et al., 2001; Poole et al., 1993; SWOOP Group, 1997). Second, the finding that individuals frequently call the HCIL with health care questions about young children is common to the research literature. Three of the articles (Greenburg, 2000; Kalman et al., 2001; Poole et al., 1993) reviewed for this study involved telephone nursing services for pediatric populations, while another study reported that half of the total calls related to patients less than 15 years old (Dale et al., 1998). Third, using a slightly modified version of the same research instrument, this researcher closely mirrored the reported study after Greenburg's (2000) study. The first-time user rate of 25% found in this study closely aligns with the 30% first-time user rate found by Greenburg, as well as the 27% first-time user rate found by Moore et al. (2002). Furthermore, callers to the HCIL accessed the service an average of 2.9 times in the previous six months while Greenburg (2000) found that callers used a similar telephone nursing service an average of 3 times in a six-month period.

Fourth, none of the research literature reviewed for this study specifically examined the potential relationship between level of satisfaction and self-care advice outcomes. However, in one study the relationship between patient compliance with the nurse's recommendation and level of patient satisfaction was examined; findings suggested that callers who were very satisfied with the telephone nursing service were more than four times more likely to be compliant than less satisfied callers (Moore et al., 2002). The finding from this study that showed no significant relationship between level of patient satisfaction and self-care advice outcomes can be neither confirmed nor refuted

by other research findings. Yet, to further discuss the potential relationship between level and satisfaction and self-care advice, it is important to note the limitations of the *Satisfaction Survey* in determining such a relationship. Items #5 and #6 on the *Satisfaction Survey* do not allow for a detailed determination of what suggestions were actually agreed with and followed. In most instances, the HCIL nurse made more than one care suggestion. Participants may have answered yes if they had agreed or followed only one of several suggestions. Therefore, future endeavors should involve the use of a research instrument that elicits specific information about the advice followed. Additionally, the Hawthorne Effect was likely seen in responses to items #5 and #6. Participant's may have felt that responding yes to these questions was expected, or was the socially acceptable answer, or they might be viewed as a "bad" patient, or parent in the cases where callers were getting care advice about their child.

Finally, making comparisons related to content analysis findings from this study is difficult because very little content analysis findings were reported in the literature. Greenburg (1999) identified the following themes in responses from survey items #13, #14, and #15 (likes/dislikes, suggestions, comments respectively) of the *Satisfaction Survey*: nursing, call return, service/convenience, hold time, reception, recording, and language. This researcher chose not to verify Greenburg's themes which again complicates the task of making comparisons from the content analysis data. However, similar to the findings from this study, many responses were related to specific abilities and attitudes of the nurses, accessibility of the service, and characteristics of the telephone system such as ease of use and timeliness of service. Example responses from Greenburg's findings included: "Nurses were extremely helpful every time I called,"

“Took too long to be called back,” “Fast and helpful service,” “Have phone answered by person, not machine,” and “The bilingual option is great.” In another study, researchers reported analysis of a focus group regarding the experiences, expectations, and values of telephonic nursing programs as perceived by patients (Greenburg & Schultz, 2002). In terms of experiences, patients felt that the nurses were pleasant, knowledgeable, and trustworthy while also including the patient in the decision-making process and saving them time by avoiding an appointment or unnecessary visit to an emergency department. These results certainly mirror the results of this study.

Qualitative data detailing reasons for dissatisfaction with telephone nursing services are rarely discussed in the literature. However, one study focused specifically on callers who expressed any element of dissatisfaction about their telephone consultation (Dale & Crouch, 1997). The authors identified three issues to consider in improving the practice of telephone consultation: 1) training in telephone communication skills should be provided to any nurse performing telephone consultation; 2) information and advice given over the telephone should be reliable and consistent; and 3) the practice of telephone consultation should be governed by organizational policies and regularly audited for quality and outcome evaluation. This researcher certainly agrees with the broad themes identified in the study by Dale and Crouch; the areas of dissatisfaction revealed in this study were consistent with their findings. However, each telephone nursing service is likely to have areas of dissatisfaction that are quite specific. For example, in this study several participants voiced dissatisfaction with the automated telephone system itself, which has nothing to do with the nurses or the quality of advice provided by the nurses.

The theoretical framework used in this study contends that patient satisfaction is an indicator for the quality of medical care (Donabedian, 1988). Using this framework, the researcher developed a schematic representation of a patient's response to an encounter with a telephone nursing service. The model depicted an interrelationship between the overall satisfaction with services and agreement with self-care advice as well as decision to follow self-care advice. In addition, the model depicted that the overall satisfaction with services predicts the likelihood of using the service again and of recommending the service to friends or family. The findings from this study do not fully support this model. No significant relationship was found between overall satisfaction with services and following self-care advice. However, most callers did report agreement with as well as following the self-care advice given by the nurses.

### **Implications for Clinical Practice**

Telephone nursing services provide an alternative method of accessing care by answering questions, assessing symptoms, triaging patients to the most appropriate level of care, giving self-care advice, and minimizing barriers within a health care system. Based on the results of this study, callers reported a high level of satisfaction with the telephone nursing service under examination. Callers not only found the nurses to be helpful, but agreed with the nurses' suggestions for care and followed these suggestions. Telephone nursing services are believed to facilitate access to appropriate levels of care, enhance continuity of care, and improve quality by providing access to information and services while reducing costs. As a result, many health maintenance organizations have implemented telephone advice services to assist in demand management. In order to be

effective, telephone nursing services need to employ professional nurses that possess advanced communication and assessment skills. In addition, the research literature supports the use of standard protocols to guide the practice of telephone nursing in order to promote safety and enhance quality. Finally, callers expressed positive comments about nurses that were knowledgeable, understanding, patient, and caring. Although the results of the study did not find a statistically significant relationship between the level of satisfaction among users of the service and following self-care advice, the positive rapport a nurse establishes with a patient is still important in influencing health care behaviors. Nurses always have, and always will, play an integral role in educating patients and shaping the health care delivery system.

### **Implications for Nursing Administration**

Two of the most important areas of concern for nurse administrators in today's health care environment are cost and quality. With ever increasing health care costs, managed care organizations continually strive to improve the overall health of their client population, integrate care management, and reduce utilization of services. Nurse administrators need to evaluate the effectiveness of telephone nursing services in reducing costs by averting emergency room visits and/or decreasing the demand for primary care appointments. While pursuing these goals, nurse administrators must continue to monitor patient satisfaction as an indicator of quality of care. In addition, as a recognized nursing subspecialty area, telephone nursing practice requires the attention of nurse administrators in order to ensure standardized practice through the use of protocols and optimize staff competence through education and training. The findings of this study



reflect the high level of satisfaction that can be attained by a telephone nursing service. However, negative comments about the service, such as inadequacies of the automated telephone system and a lack of certain resources for the nurses, identify areas of improvement on which nurse administrators may focus their attention.

### **Recommendations for Nursing Research**

1. Replication of this study is suggested utilizing a different, or expanded, patient satisfaction tool that more accurately measures the degree to which callers agree with and follow the advice received from the nurse.
2. Replication of this study is suggested using a larger sample in order to improve the statistical power for determining a statistically significant relationship between patient satisfaction and self-care advice outcomes. However, researchers should also consider effect size for clinical significance in determining the size of the sample.
3. Future studies examining patient satisfaction and self-care advice outcomes should include validation of callers' self-reported compliance in following the nurses' advice through review of medical claims or encounter data.
4. In replication of this study, all demographic queries (to include age, gender, and beneficiary status) should be included on the survey instrument to eliminate unforeseen problems in obtaining data from callers who are not military beneficiaries.
5. Researchers planning to evaluate the effectiveness of telephone nursing services should focus their attention on patient compliance with the nurse's advice and

related outcomes such as decreases in emergency department visits and/or primary care appointments.

6. In order to study patient compliance with telephone nursing advice, future research must include the development of a better tool to measure patient compliance.

### **Finale**

In today's high-tech society, some fear that telehealth practices, such as telephone nursing, cause the nurse-client relationship to suffer without the opportunity for face-to-face contact. On the contrary, participants in this study overwhelmingly had positive comments about the nurses they spoke with and many reported a feeling of calm or reassurance at a time during the day or night when no one else was readily available. Although nursing requires a broad knowledge base and a multitude of skills, the art of caring is still the basis of the profession, whether done in person or over the telephone.

## **APPENDIX A**

### **SATISFACTION SURVEY WITH PERMISSION LETTER**

### Satisfaction Survey

Facility X offers a nursing telephone service that you can call to have a nurse help you decide whether or not you need an appointment, how soon you should be seen, and where you should be seen. The nurse can also provide advice and information about any medical or health problems or concerns you may have.

1) On \_\_\_\_\_ you called the Health Care Information Line and spoke with a nurse. Was this the first time that you have called this service? Yes\_\_\_\_ No\_\_\_\_

If yes, go to question 3.

If no,

2) How many times have you called the service and talked with a nurse in the last 6 months? \_\_\_\_\_

Now I have some questions about the (date)\_\_\_\_\_ when you spoke with the advice nurse.

3) Can you tell me why you called to talk with a nurse?

4) What was the result of the phone call?

5) Did you agree with the nurses suggestion(s)? Yes\_\_\_\_ No\_\_\_\_ N/A\_\_\_\_

6) Did you follow the suggestion(s)? Yes\_\_\_\_ No\_\_\_\_ N/A\_\_\_\_

7) If no, what did you do instead?\_\_\_\_\_

8) If you hadn't talked to the nurse, what would you have done?\_\_\_\_\_

9) If yes (to item 6), on a scale from 1 to 9 with 1 being extremely unhelpful and 9 being extremely helpful, how helpful was the nurse in meeting your needs?

10) On a scale from 1 to 9 with 1 being extremely dissatisfied and 9 being extremely satisfied how satisfied were you overall with this telephone service?

11) On a scale from 1 to 9 with 1 being extremely unlikely and 9 being extremely likely how likely are you to use this service again?

12) On a scale from 1 to 9 with 1 being extremely unlikely and 9 being extremely likely how likely are you to recommend this service to your friends or family?

13) What was it about this service that you particularly liked and/or disliked?

---

14) How do you think this service can be improved?

\_\_\_\_\_

15) Are there any comments you would like to add?

\_\_\_\_\_

Thank you very much for your help.

**\*\* The participant's age, gender, beneficiary status, and rank (or rank of sponsor as applicable) will be obtained from the computer printout from the telephone encounter.**

**Caller:** Age\_\_\_\_\_ Gender \_\_\_\_\_ BS \_\_\_\_\_ Rank \_\_\_\_\_

**Patient:** Age\_\_\_\_\_ Gender \_\_\_\_\_ BS \_\_\_\_\_ Rank \_\_\_\_\_

May 6, 2002

April Eckerman  
Wright State University

Dear Ms. Eckerman,

In 1999 I developed a Satisfaction Survey for use in evaluating a nursing telephone service. You have my permission to use the survey for your research. Good luck on your project.

Sincerely,

*M. Elizabeth Greenberg*

M. Elizabeth Greenberg

M. Elizabeth Greenberg MS RNC  
Doctoral Student  
University of Arizona  
maryg@nursing.arizona.edu

**APPENDIX B**

**AGENCY ACCESS FORM**

Wright State University - Miami Valley  
College of Nursing and Health

AGENCY PERMISSION FOR CONDUCTING STUDY

THE \_\_\_\_\_

GRANTS TO Captain April L. Eckerman

A student enrolled in a program of nursing leading to a Master's degree at Wright State University, the privilege of using its facilities in order to study the following problem:

Patient Satisfaction and Self-care Advice Outcomes

with a Telephone Nursing Service

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: 1 Nov 2002

April L. Eckerman  
April L. Eckerman  
Student

Chair, Institutional Review Board

Patricia A. Martin  
Patricia A. Martin, Ph.D., R.N.  
Faculty Director



## **APPENDIX C**

### **INTRODUCTORY STATEMENT**

### **Introductory Statement/Disclaimer**

May I speak with \_\_\_\_\_?

Hello, my name is April Eckerman. I am a registered nurse and graduate student at Wright State University. I am conducting a research study to identify how you feel about the telephone nursing service offered by Facility X. I chose this topic because I am in the military myself.

Since you have called the Health Care Information Line within the last 72 hours, I am inviting you to participate in a survey about your experience. Facility X receives a written record from each call to the Health Care Information Line and that is how I got your name and telephone number. The purpose of the survey is to find out how well the telephone program meets the needs of the callers. By responding to questions in the survey, you will be giving your consent to participate in the study. I would greatly appreciate your help. To ensure privacy, your name will not be used on the survey form being completed during this interview or in any part of the final report from the study. This is a telephone survey and it will take less than 10 minutes. Are you willing to participate? (*If no*: Thank you for your time, goodbye and have a nice day/evening). (*If yes*: Are you 18 years of age or older?; *If yes*: Is this a convenient time? *If no*: When is a convenient time within the next two days that I may contact you again? *If yes*, proceed with script).

Your identity will not be revealed and your confidentiality will be maintained in all reports of this project. You may choose not to answer some of the questions. Any

questions *you* have will be answered after completion of the survey and you may withdraw from the study at any time with no consequences. There are no known risks involved in your participation in the study.

You can obtain further information from me, April Eckerman, or my thesis chair, Dr. Patricia Martin at (937) 775-3133 if you have questions at a later date.

## **APPENDIX D**

### **IRB APPROVAL LETTER**



Office of Research and Sponsored Programs  
201J University Hall  
3640 Col. Glenn Hwy.  
Dayton, OH 45435-0001  
(937) 775-2425  
(937) 775-3781 (FAX)  
e-mail: rsp@wright.edu

**DATE:** November 5, 2002

**TO:** April L. Eckerman, P.I., Student  
Patricia A. Martin, Ph.D., Fac. Adv.  
College of Nursing & Health

**FROM:** Robyn James, Sponsored Programs Assistant  
Secretary to the WSU Institutional Review Board

**SUBJECT:** SC# 2706

*'Patient Satisfaction And Self-Care Advice Outcomes With A Telephone Nursing Service'*

This memo is to verify the receipt and acceptance of your response to the conditions placed on the above referenced human subjects protocol/amendment.

These conditions were lifted on: November 05, 2002

This study/amendment now has full approval and you are free to begin the research project. This implies the following:

1. That this approval is for one year from the approval date shown on the Action Form and if it extends beyond this period a request for an extension is required. (Also see expiration date on the Action Form)
2. That a progress report must be submitted before an extension of the approved one-year period can be granted.
3. That any change in the protocol must be approved by the IRB; otherwise approval is terminated.

If you have any questions concerning the condition(s), please contact me at 775-2425.

Thank you!

/rdj

Enclosure

ACTION OF THE WRIGHT STATE UNIVERSITY  
SCREENING COMMITTEE  
Assurance Number: FWA00002427

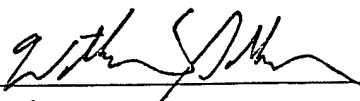
Title: *'Patient Satisfaction And Self-Care Advice Outcomes With A Telephone Nursing Service'*

Principal Investigator: April L. Eckerman, P.I., Student  
Patricia A. Martin, Ph.D., Fac. Adv.  
Department: College of Nursing & Health

The Institutional Review Board Screening Committee has approved the use of human subjects on this proposed project with conditions previously noted. The conditions have now been removed.

REMINDER: FDA regulations require prompt reporting to the IRB of any changes in research activity, changes in approved research during the approval period may not be initiated without IRB review (submission of an amendment), and prompt reporting of any unanticipated problems (adverse events).

NOTE: This approval has been assigned an "SC" number in our system, which means it has been approved by the Screening Committee for a protocol involving no more than minimal risk.

  
Signed \_\_\_\_\_ Coordinator, WSU-IRB  
Screening Committee Date: October 25, 2002  
IRB Meeting Date: November 18, 2002

**This approval is effective only through: October 25, 2003**

To continue the activities approved under this protocol you should receive the appropriate form(s) from Research and Sponsored Programs (RSP) two to three months prior to the required due date. If you do not receive this notification, please contact RSP at 775-2425.

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